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COQUILLE RIVER BASIN. WATER SUPPLY AND WATER QUALITY CONTROL RECONNAISSANCE STUDIES

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COLUMBIA RIVER BASIN PROJECT
For Water Supply and Water Quality Management

COQUILLE RIVER BASIN
Water Supply and Water Quality Control Reconnaissance Studies

Date: July 1962

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U.S. DEPARTMENT OF HEALTH, EDUCATION AND WELFARE
Public Health Service
Region IX

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This working paper contains preliminary data and information primarily intended for internal use by the Columbia River Basin Project staff and cooperating agencies. The material presented in this paper has not been fully evaluated and should not be considered as final.

COQUILLE RIVER BASIN
Water Supply and Water Quality Control Reconnaissance Studies

INTRODUCTION

This is submitted in accordance with our agreement to supply the Portland District, Corps of Engineers, with preliminary data relative to municipal and industrial water supply and stream quality control considerations associated with reconnaissance studies being conducted by that agency in the Coquille River Basin.

The areas and stream reaches of primary concern lie along and downstream from river mile 30 of the South Fork Coquille River and along the main stem Coquille River from the confluence of the North Fork to the mouth at the Pacific Ocean. Included in the study, also, because of certain relationships with the Coquille River Basin, is an adjoining portion of the coastal region of the Coos River Basin lying to the north.

Studies involve urban developments in Coos County, Oregon with centers at Powers (pop. 1500); Myrtle Point (pop. 2900); Coquille (pop. 5000); Bandon (pop. 3900); and Coos Bay Urban Area (pop. 23,000). All of these areas utilize surface waters for water supply either impounded or as naturally flowing with the exception that a portion of the industrial supply in the Coos Bay region is taken from a newly developed ground supply located in the

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Coastal sand dunes area. All areas use downstream or adjacent waters for the disposal of municipal and industrial wastes.

PRESENT WATER SUPPLY

It is estimated that at the present time, about 2,200 acre-feet of water (excluding uses for logging operations) are used annually for major municipal and industrial (M&I) supply purposes in the Coquille River Basin and that about 11,000 acre-feet are used for these purposes annually in the Coos Bay area. Essentially all of this water with the exception of about 1700 acre-feet taken from the dunes supply is obtained from surface sources of which about 400 acre-feet are taken annually from the South Fork Coquille River and Bingham Creek Watershed (Powers), 600 acre-feet from the North Fork (Myrtle Point), 700 acre-feet from the main stem Coquille River and Rink Creek Watershed (Coquille), 500 acre-feet from Ferry Creek and Springs (Bandon) and 9,300 acre-feet from Pony Creek Watershed and miscellaneous sources (Coos Bay, North Bend, Eastside, Englewood, Empire, Bunker Hill and Charleston area).

Seasonal M&I water use estimates indicate that approximately 50 percent of the annual demand in the Coquille Basin occurs during the months of June through September and that with full exercise of water rights for logging (3,800 acre-feet annually), a total of 2,400 acre-feet of water would be used during this period.

From a review of water rights for M&I purposes, it appears that applications and certificates totaling more than 50,000 acre-feet annually are in existence in the Coquille River Basin. In the absence of analyses of priorities or apportionments of possible shortages among these and rights for other purposes, it is estimated that on a June-September use basis, rights at Powers are essentially fully exercised; at Myrtle Point about 60 percent exercised; and at Coquille and Bandon about 10-15 percent exercised.

From an examination of stream gaging records and estimates of minimum natural yields in the M&I use areas of the Coquille Basin, it appears that ample water is available in all localities to satisfy the full exercise of M&I and logging rights.

M&I water use in the Coos Bay area during the maximum use months of June through September is estimated to be about 3,700 acre-feet (excluding water taken from the dunes supply for industrial purposes) or about 30 percent of that assigned to the area by right applications and M&I water use certificates. A comprehensive study, however, would be required in this area as well as in several areas in the Coquille Basin to determine more exactly to what extent waters assigned by the various rights could be feasibly developed for future use. Such factors as development costs, dependable yields, quality, and ownerships may be significantly limiting in this regard.

FUTURE WATER SUPPLY

The major water supplies in Coos County as previously enumerated serve approximately 36,500 persons, 1,050 commercial establishments and about 80 industries varying in kind from bottling companies to pulp mills. According to economic base studies and growth forecasts prepared by this office (study report attached) for Coos County, the urban populations will have increased to about 61,000 by the year 1980 and to 121,000 by the year 2010. The major source of growth is expected to be attributable to a severe increase in the conversion of waste wood materials to pulp and paper. It is also expected, due to such factors as deep water port facilities, water supply and waste disposal factors, railroad facilities and location relative to large timber holdings of Georgia Pacific and Weyerhaeuser Corporations that the expansion of manufacturing will occur around the Coos Bay area. Production of pulp and paper in the order of 1,000 tons per day by the year 1980 and 2,000 tons per day by the year 2000 is believed possible. (Present production in the area is about 200 tons per day.)

Economic expansion in the Coquille River Basin is expected to be at a slower rate than in the Coos Bay area; however, some spillover of economic growth from Coos Bay is likely to benefit Coquille River Basin development.

In addition to the anticipated expansion in pulp and paper manufacturing, the timber resource is expected to support additional production of lumber and wood products. Not only the timber in Coos County, but also that in the northern part of Curry County is likely to be processed in cities in the Coquille or Coos River Basins. Other factors which may provide some future growth and further diversification of the economy include tourist-oriented activities along the coast and in the national forests; and minerals, among which are titanium-bearing sands.

It is estimated that by the years 1980 and 2010, respectively, 61,300 and 121,300 persons will be served by major water supply systems in the Coquille and Coos Bay region. Inasmuch as national trends indicate year by year increases in per capita demands for M&I water, it is expected that the average annual per capita demands exclusive of that for pulp and paper manufacturing in the Coquille and Coos Bay region will range according to area between 125 and 215 gallons per capita per day (gpcd) by the year 1980 and between 185 and 285 gpcd by the year 2010. Assuming that pulp and paper manufacture would be accomplished by the Kraft (sulfate) process, it is estimated (based on a typical pulp and paper plant located in a water-short area) that 53,000 gallons of water would be required per ton of pulp produced.

Total annual water supply requirements by the years 1980 and 2010 for the Coquille and Coos Bay region based on the projected

populations, per capita demands and the pulp and paper production anticipated are estimated to be about 71,500 acre-feet and 152,000 acre-feet for these years, respectively. The tabulation to follow shows a breakdown of these requirements by areas within the study region.

Coos Bay and Coquille River Basins
M&I Water Supply Requirements

1960

Location	Population Served	Avg. gpcd	Avg. MGD	Ann. Avg. Ac.-ft.
Powers	1,500	173	0.26	385
Myrtle Point	2,900	174	1.25	570
Coquille	5,000	120	0.60	685
Bandon	3,900	103	0.40	455
Coos Bay Area	23,200	134	3.1	3,550
Pulp & Paper	-	-	6.6	7,500
Totals	36,500		12.21	13,145

1980

Powers	2,000	212	0.42	480
Myrtle Point	4,100	213	0.87	990
Coquille	7,400	146	1.08	1,230
Bandon	4,900	126	0.62	710
Coos Bay Area	42,900	163	7.0	8,000
Pulp & Paper	-	-	52.5	60,000
Totals	61,300		62.49	71,410

2010

Powers	2,600	284	0.74	850
Myrtle Point	5,300	285	1.51	1,720
Coquille	13,100	196	2.56	2,900
Bandon	5,900	185	1.10	1,260
Coos Bay Area	94,400	220	20.8	24,800
Pulp & Paper	-	-	105.0	120,000
Totals	121,300		131.71	151,530

Assuming that full exercise of existing water right applications and certificates is permitted, it appears, with the exception of the community of Powers, that M&I water would be available to meet future demands in the Coquille River Basin including satisfaction of demands during maximum use periods.

At Coos Bay, however, future demands associated mainly with pulp and paper manufacturing will exceed water available both by rights and dependable yields. Sources available to the area are the sand dunes supply located north of Coos Bay (yield - 30 MGD) and possible development of storage on the North Fork Coquille River, South Fork Coos River and West Fork of the Millicoma River. A thorough engineering study would be required to determine the relative feasibilities of developing these or other possible sources in the area as well as to establish suitable plant sites for water service, waste disposal and various other operational contingencies.

WATER QUALITY

It is estimated that about 32,000 population equivalents (P.E.'s) of unstable organic materials are produced per day by the populations and industries located along the South Fork and upper main stem of the Coquille River and that over 270,000 P.E.'s per day are produced in the Coos Bay region.

Municipal waste treatment works in these regions consist mainly of primary treatment. Logging and pulping wastes enter the receiving waters of these areas essentially untreated.

Inasmuch as the Coquille River and tributaries are important fishing and recreational streams, maintenance of sufficient dissolved oxygen (D.O.) levels at all times and in all sections of these streams is highly essential. It is estimated from an examination of minimum stream discharge data on the South Fork and main stem Coquille Rivers that present waste loadings can be received and assimilated throughout these reaches without incurring serious depletions in the D.O. resource. For example, sampling data collected by the Oregon State Sanitary Authority in 1960 and 1961 show that D.O. levels in the South Fork 0.6 miles north of Powers rarely fell below 10 parts per million (ppm); and that below Myrtle Point on only two occasions out of 13 samplings from August 1960 to October 1961 did the level drop to 6.3 ppm (5-6 ppm of D.O. is generally considered adequate for fish and other aquatic life).

Whereas it is apparent that partial waste treatment accomplishes satisfactory control of stream quality at the present time and inasmuch as higher levels of conventional treatment are available to keep pace with the future increases in wastes expected, augmentation of low flows for maintenance of stream quality in the Coquille River does not at this time appear warranted.

DISCUSSION

The availability of substantial raw materials together with water and power development potentials in Coquille and Coos River Basin areas is expected to greatly influence an expansion of industrial activity in this region. As expansion is expected to center mainly around the manufacture of pulp and paper, large volumes of water and waste would be involved.

As previously indicated, economic advantages would appear to favor the Coos Bay area as the location of future pulp and paper production. In addition, plant sites located in this area rather than at interior basin locations would offer opportunities for ocean disposal of wastes, thereby eliminating possible interference with fresh water uses and/or users. For example, to be compatible with fisheries and recreational uses of the Coquille River, pulp and paper production by the sulfate pulping process in the Myrtle Point area with complete biological treatment of wastes would be limited to less than 100 tons per day. Greater rates of production could be permitted, however, in event that stream flow regulation for quality maintenance were specifically provided.

In view of the probability that pulp and paper production will take place in the Coos Bay area, it is apparent that water source development either in lieu of or as supplements to sources presently in existence will be required. Because of the large demands expected and the need for dependability of supply, it is

believed that source development would, by necessity, consist of upper watershed storage with conduit transmission to respective plant sites.

Of equal importance to the physical, hydrologic, and economic considerations associated with storage development are considerations of relative water quality. Such determinations would be involved in the establishment of storage, for example, on the West Fork Millicoma River, South Fork Coos River or North Fork Coquille River, or at possible Federal multiple-purpose project reservoir sites. Water treatment expenditures, for example, may outweigh cost differences involved in transporting waters greater distances.

The data, forecasts, and statements herein presented are based on limited data and on a very cursory examination of elements involved in the study area. Although the material is believed sufficient for reconnaissance purposes, a complete evaluation of water supply and quality control benefits associated with proposed Federal water resource development in the Coquille and Coos River areas would require thorough comprehensive study.